



## Case report

# Diagnosis and treatment of lymph node metastases of a rectal carcinoid tumor using In111-octreotide-scintigraphy and intraoperative gamma probe detection

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## ABSTRACT

Carcinoids represent 1–2% of the rectal cancer. We report the case of a woman with a rectal carcinoid and a hypogastric node metastasis. We propose a less invasive treatment of the metastase using In111-octreotide-scintigraphy and intraoperative gamma-probe detector.

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## 1. Introduction

Carcinoid tumors are included in the Apudoma category. They represent 1–2% of cancers of the rectum. These tumors may be asymptomatic and they are accidentally diagnosed during endoscopy screening. Proctorrhagia is the most common clinical manifestation.<sup>1</sup> Most neuroendocrine tumors (NET) express receptors for somatostatin (SS), and thus can be successfully detected using radiolabeled antibodies against the SS receptor. Some tumors of neuroectodermal origin express receptors for SS, and they are detectable by SRS (somatostatin receptor scintigraphy), among these are carcinoid, medullary thyroid cancer, paragangliomas and neuroblastomas.<sup>2</sup> The main study published by Krenning et al. (1993) and other experience have validated the SRS with 111Indium-DTPA-octreotide as a standard imaging technique for neuroendocrine tumors.<sup>3</sup> Many studies have shown that SRS is more sensitive than conventional methods for identifying metastases.<sup>4</sup> The radio-guided surgery with gamma-probe

has proved useful in the management of neuroendocrine tumors, particularly with regard to the inguinal-femoral metastases.

## 2. Case presentation

A 49-year-old asymptomatic woman underwent colonoscopy for proctorrhagia. Blood tests were normal, the patient having only mild and nonspecific lymphocytosis. Endoscopic examination of the distal rectum demonstrated a sessile polyp of about 15 mm in diameter. It was removed by diathermy loop. Histological examination described the lesion as carcinoid, the structure was partly classical and partly glandular, infiltrating the submucosa. The Ki67 positivity was 1–2%. Near the margin of resection the histological examination demonstrated low-grade carcinoid cells. We adopted a close surveillance policy. After two months we performed a colonoscopy with biopsies in the polypectomy area that came back negative. CT was performed after 3 months and MRI and US were performed after 6 months for staging. All showed the absence of recurrence. In line with international protocols for staging carcinoids a 111In-octreotide (Octreoscan™) was also carried out 6 months postoperatively. This documented an outbreak of hyperfixation in the left pelvic region (iliac fossa) at the iliac-hypogastric lymph node chain, a finding suggestive of the presence of lymph node localization expressing somatostatin receptors and therefore, worthy for further investigation. The results of a SRS after 3 months were similar to the previous ones, so we opted for

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surgical treatment. Five hundred MBq of  $^{111}\text{In}$ -octeoscans<sup>TM</sup> were administered 16 h before the procedure. A Leriche incision was performed, exposing the iliac obturator hypogastric region. After careful exploration with the probe for radioguided surgery (with window adequate to Indium emission), a small hard lymph node was located behind the hypogastric vessels. It was characterized by signal-to-background ratio of 7:1. After the node removal the background activity in the iliac-hypogastric region remained equal to the contralateral side. Histological examination of the surgical specimen confirmed lymph node localization of well-differentiated endocrine tumor, compatible with carcinoid.

### 3. Discussion

Surgical resection of primary tumor and lymph node metastases is the only curative method for carcinoids. Recently, endoscopic treatment was applied for carcinoids of the gastrointestinal tract. Selecting the most appropriate treatment requires a precise characterization in terms of localization and definition of size, depth of invasion and histological type. It also requires adequate staging. Rectal carcinoids less than 10 mm in diameter contained in the submucosa without evidence of lymphatic metastases are endoscopically resectable.<sup>5</sup> As for carcinoids between 10 and 15 mm, the therapeutic strategy remains controversial.<sup>6</sup>

The present polyp was 15 mm, thus within the range limits in which endoscopic removal can be performed. In agreement with the case studies by Lamberts et al.,<sup>7</sup> 87% of carcinoids express somatostatin receptors, and this is why they can be detected with remarkable sensitivity by SRS with Indium-111-octreotide. It is currently established that this method is more sensitive than CT or ultrasound for diagnosis, staging and follow-up.<sup>7,8</sup> Using the probe for radioguided surgery, intraoperatively after administration of Indium-111-octreotide, is more sensitive than using SRS or intraoperative palpation, therefore it allows a more radical surgery.<sup>9–13</sup> However, we have to point out that this procedure can be quite complicated since, the probe detects a relatively large amount of background due to nearby structures (mainly small bowel) which may retain the radioactive tracer. The problem can be partly solved with a careful study of visualization times of both the lesion and the intestine at the time of SRS diagnostics. The advantage of using the probe during the surgical removal of lymph nodes metastasis is that it ensures a radical surgery without performing an extended resection procedure, as in our case it would have been the full removal of ilio-hypogastric lymph node.

### 4. Conclusions

In cases of small rectal carcinoids, it is important to perform SRS-Indium-111-octreotide before surgery to determine the extent of fixation of the tracer and the presence of metastases, even if

CT, MRI and endoscopic ultrasonography are negative. The SRS is also strongly recommended for follow-up. The main point of interest is the use of radioguided surgery in selected cases, which can allow a radical intervention in cases of lymph node metastases, while performing a less extended and/or aggressive procedure than the exploration of the entire neighboring lympho-adipose tissue. It should be noted that the method has some technical difficulties related to the background noise. This makes the identification of the peak of radioactivity more challenging, and requires a careful exploration of the region of interest.

### Conflicts of interest

None.

### Funding

None.

### Ethical approval

All the patient in our department are informed that their clinical cases may be published in anonymous formality.

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